

Claims

What is claimed is:

- 1     1.    A method for communication between a first computer operating in a first object-  
2           oriented run-time environment and a second computer operating in a second, different  
3           object-oriented run-time environment, the method comprising:  
4                 sending a first message with an object identification and an action identification  
5                 from the first computer to the second computer;  
6                 identifying an object in the second run-time environment according to the  
7                 object identification;  
8                 determining an action representation of an action, according to the action  
9                 identification, in the second run-time environment for the identified object; and  
10                executing the action using the action representation.
- 1     2.    The method of claim 1 further comprising verifying an existence of an action,  
2           according to the action identification, in the identified object in the second run-time  
3           environment.
- 1     3.    The method of claim 1 wherein executing the action includes:  
2                 converting a request identification that is part of the action identification to a  
3                 second representation for the second run-time environment using a look-up table; and  
4                 inserting the further representation into the second application.
- 1     4.    The method of claim 1 further comprising returning to the first computer a second  
2           message as a confirmation message with an object identification and a response  
3           identification.
- 1     5.    The method of claim 4 further comprising displaying, using the first computer, at  
2           least a portion of the response identification.

- 1     6.    The method of claim 1, wherein executing the action further comprises:  
2               extracting a second property representation of a property identified by the  
3               action identification;  
4               converting the second property representation to a first property representation  
5               for the first run-time environment; and  
6               returning to the first computer a second message as a result message with an  
7               object identification and a response identification, the response identification  
8               indicating the further first property representation for the first run-time environment.
- 1     7.    The method of claim 4 further comprising displaying, using the first computer, at least  
2               a portion of the response identification.
- 1     8.    The method of claim 1, wherein executing the action further comprises:  
2               converting a function identification and a parameter identification of the action  
3               identification to function and parameter representations for the second run-time  
4               environment;  
5               performing a function that is identified by the action identification using the  
6               function and parameter representations for the second run-time environment;  
7               converting parameters that result from performing the function into parameter  
8               representations for the first run-time environment; and  
9               returning a second message to the first computer with an object identification  
10              and a response identification, with the response identification indicating the parameter  
11              representations.
- 1     9.    The method of claim 8 wherein converting parameters uses a look-up table.

- 1     10.   A computer program product used in a communication system of a first computer  
2           with a first object-oriented run-time environment and a second computer with a  
3           second, different object-oriented run-time environment, wherein the first computer  
4           sends a first message with an object identification and an action identification to the  
5           second computer, the computer program product embodied on a carrier and having  
6           computer code instructions to cause a processor of the second computer to interpret  
7           the first message, the instructions comprising:  
8                 code for identifying an object in the second run-time environment according to  
9                 the object identification;  
10                code for determining a representation of an action, according to the action  
11                identification, in the second run-time environment for the identified object; and  
12                code for executing the action using the representation.
- 1     11.   The computer program product of claim 10 wherein the instructions further comprise  
2           code for verifying the existence of an action, according to the action identification, in  
3           the identified object in the second run-time environment.
- 1     12.   The computer program product of claim 11 wherein the instructions further comprise  
2           code for returning a second message as a confirmation message to the first computer,  
3           the second message including an object identification and a response identification.
- 1     13.   The computer program product of claim 12 wherein the code for executing includes:  
2                 code for converting a request identification that is part of the action  
3                 identification to a further representation for the second run-time environment; and  
4                 code for inserting the further representation into the second application.
- 1     14.   The computer program product of claim 13 wherein the code for converting uses a  
2           look-up table.
- 1     15.   The computer program product of claim 12 wherein the code for executing comprises:

2           code for extracting a second property representation of a property identified by  
3 the action identification;

4           code for converting the second property representation to a first property  
5 representation for the first run-time environment; and

6           code for returning to the first computer a second message as a result message  
7 with an object identification and a response identification, the response identification  
8 indicating the further first property representation for the first run-time environment.

1       16. The computer program product of claim 12 wherein the code for executing comprises:

2           code for converting a function identification and a parameter identification of  
3 the action identification to function and parameter representations for the second run-  
4 time environment;

5           code for performing a function that is identified by the action identification  
6 using the function and parameter representations for the second run-time  
7 environment;

8           code for converting parameters that result from performing the function into  
9 parameter representations for the first run-time environment; and

10          code for returning a second message to the first computer with an object  
11 identification and a response identification, with the response identification indicating  
12 the parameter representations.

- 1 17. A computer communication system comprising a first computer operating in a first  
2 object-oriented run-time environment and a second computer operating in a second,  
3 different object-oriented run-time environment, wherein the first computer sends a  
4 first message with an object identification and an action identification to the second  
5 computer, the second computer comprising:  
6 a first module to identify an object in the second run-time environment  
7 according to the object identification;  
8 a second module to verify an existence of an action identified in the action  
9 identification in the identified object in the second run-time environment;  
10 a third module to determine a representation of the action in the second run-  
11 time environment for the identified object; and  
12 a fourth module to execute the action by using the representation and to return a  
13 second message as confirmation message to the first computer, the second message  
14 with object identification and response identification.
- 1 18. The computer communication system of claim 17 wherein the fourth module is  
2 adapted to (a) convert a request identification that is part of the action identification to  
3 a further representation for the second run-time environment using a look-up table,  
4 and (b) insert the further representation into the second application.
- 1 19. The computer communication system of claim 17 wherein the fourth module is  
2 adapted to:  
3 extract a second property representation of a property identified by the action  
4 identification;  
5 convert the second property representation to a first property representation for  
6 the first run-time environment; and  
7 return to the first computer a second message as a result message with an object  
8 identification and a response identification, the response identification indicating the  
9 further first property representation for the first run-time environment.

1     20. The computer communication system of claim 17 wherein the fourth module is  
2     adapted to:  
3         convert a function identification and a parameter identification of the action  
4     identification to function and parameter representations for the second run-time  
5     environment;  
6         perform a function that is identified by the action identification using the  
7     function and parameter representations for the second run-time environment;  
8         convert parameters that result from performing the function into parameter  
9     representations for the first run-time environment; and  
10        return a second message to the first computer with an object identification and a  
11     response identification, with the response identification indicating the parameter  
12     representations.